FIG.1

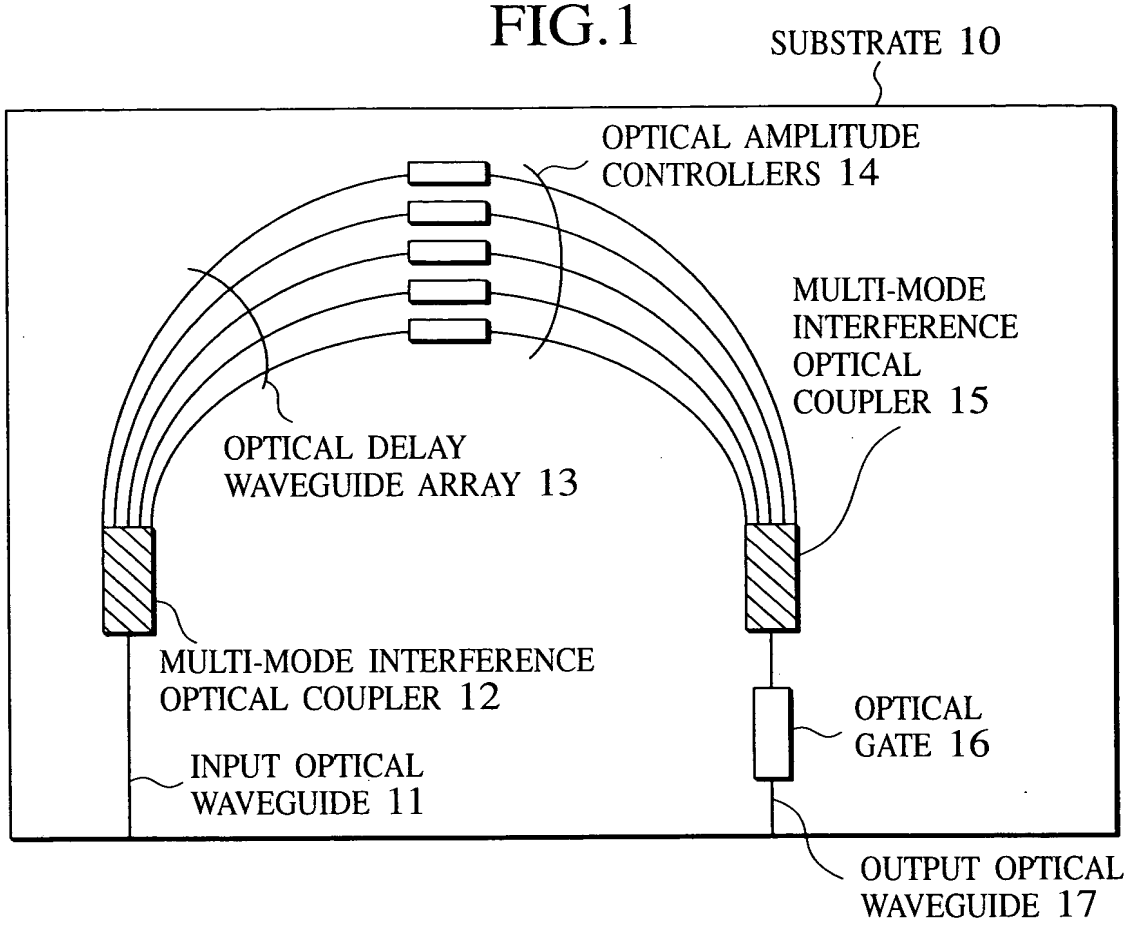
SUBSTRATE 10
OPTICAL AMPLITUDE CONTROLLERS 14
MULTI-MODE INTERFERENCE OPTICAL COUPLER 15
OPTICAL DELAY WAVEGUIDE ARRAY 13
MULTI-MODE INTERFERENCE OPTICAL COUPLER 12
OPTICAL GATE 16
INPUT OPTICAL WAVEGUIDE 11
OUTPUT OPTICAL WAVEGUIDE 17

FIG.2

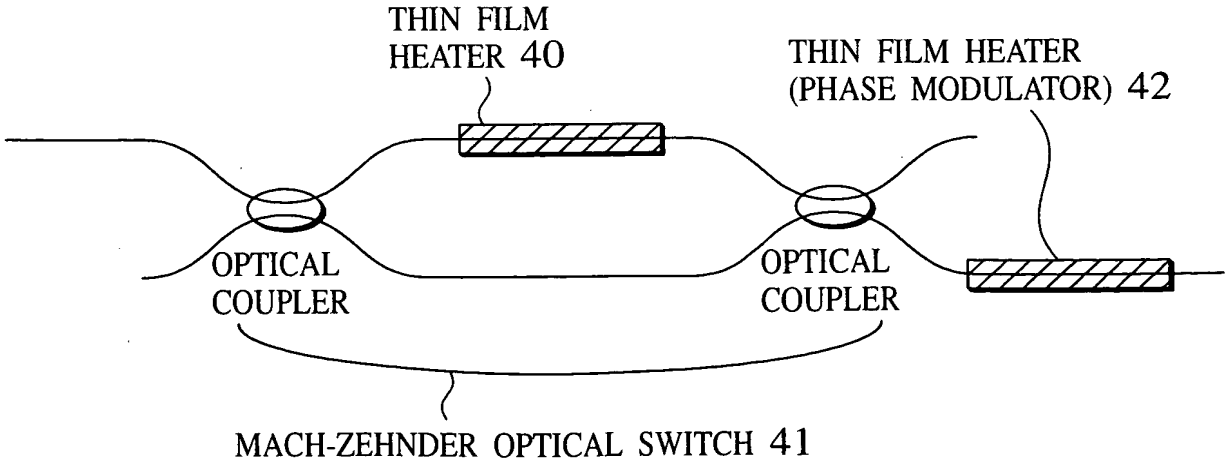
THIN FILM HEATER 40
THIN FILM HEATER (PHASE MODULATOR) 42
OPTICAL COUPLER
OPTICAL COUPLER
MACH-ZEHNDER OPTICAL SWITCH 41

FIG.3

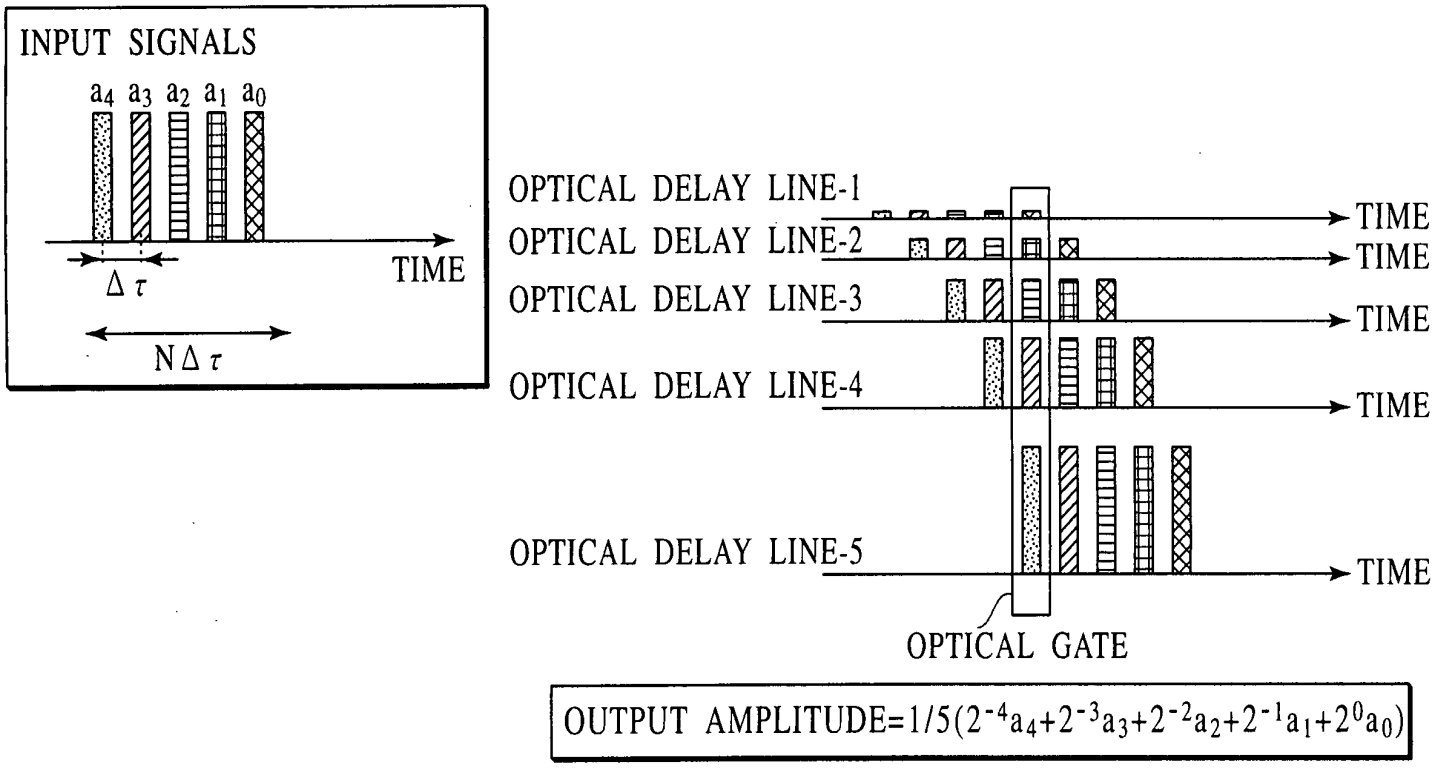
INPUT SIGNALS
a4 a3 a2 a1 a0
TIME
Δ τ
N Δ τ
OPTICAL DELAY LINE-1
OPTICAL DELAY LINE-2
OPTICAL DELAY LINE-3
OPTICAL DELAY LINE-4
OPTICAL DELAY LINE-5
TIME
TIME
TIME
TIME
TIME
OPTICAL GATE
OUTPUT AMPLITUDE=1/5(2^-4a4+2^-3a3+2^-2a2+2^-1a1+2^0a0)

FIG.4

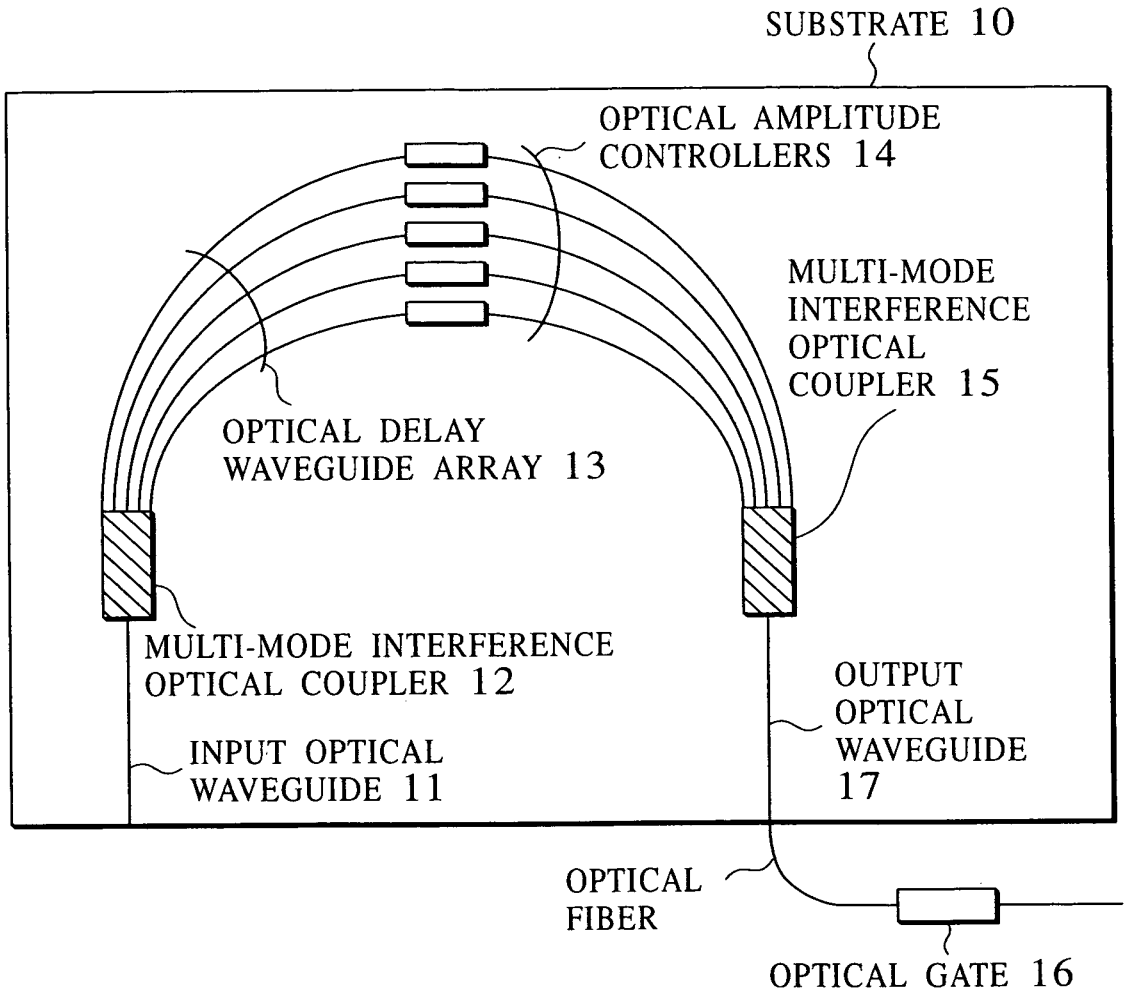
SUBSTRATE 10
OPTICAL AMPLITUDE CONTROLLERS 14
MULTI-MODE INTERFERENCE OPTICAL COUPLER 15
OPTICAL DELAY WAVEGUIDE ARRAY 13
MULTI-MODE INTERFERENCE OPTICAL COUPLER 12
INPUT OPTICAL WAVEGUIDE 11
OUTPUT OPTICAL WAVEGUIDE 17
OPTICAL FIBER
OPTICAL GATE 16

FIG.5

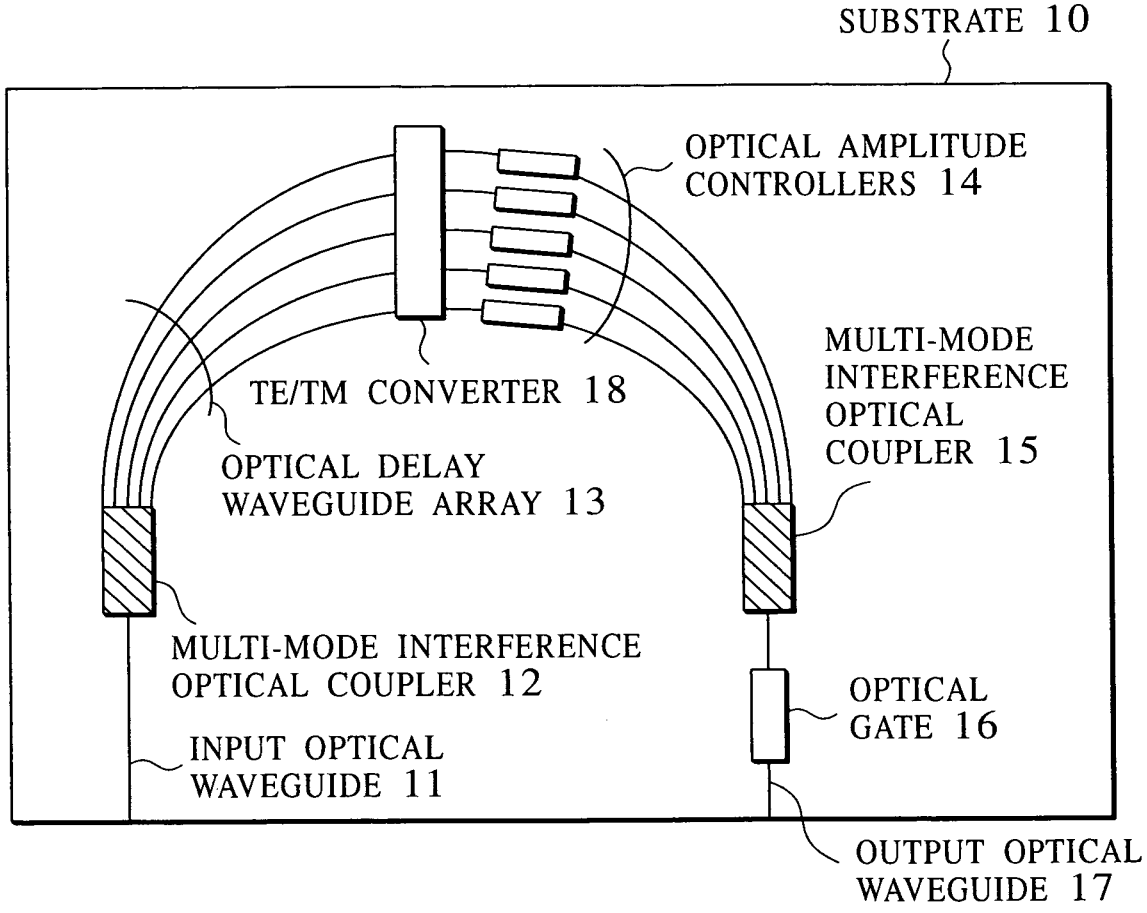
SUBSTRATE 10
OPTICAL AMPLITUDE CONTROLLERS 14
MULTI-MODE INTERFERENCE OPTICAL COUPLER 15
TE/TM CONVERTER 18
OPTICAL DELAY WAVEGUIDE ARRAY 13
MULTI-MODE INTERFERENCE OPTICAL COUPLER 12
OPTICAL GATE 16
INPUT OPTICAL WAVEGUIDE 11
OUTPUT OPTICAL WAVEGUIDE 17

FIG.6

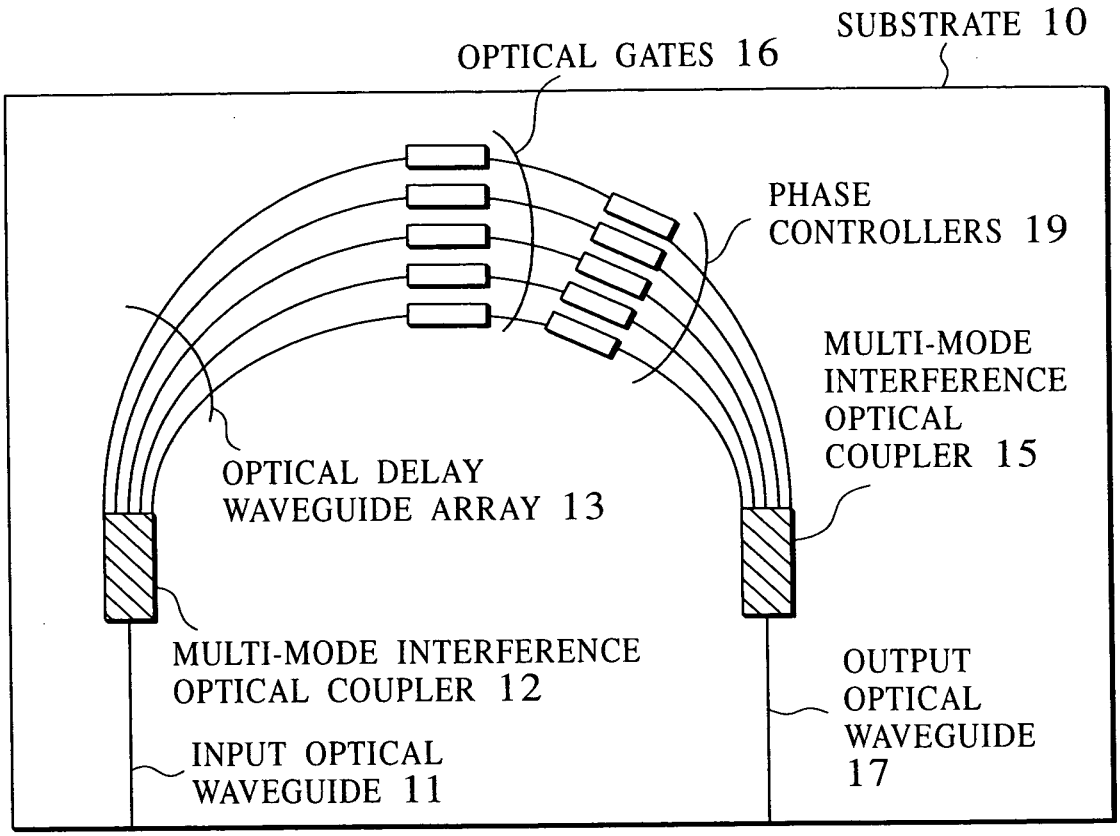
SUBSTRATE 10
OPTICAL GATES 16
PHASE CONTROLLERS 19
MULTI-MODE INTERFERENCE OPTICAL COUPLER 15
OPTICAL DELAY WAVEGUIDE ARRAY 13
MULTI-MODE INTERFERENCE OPTICAL COUPLER 12
OUTPUT OPTICAL WAVEGUIDE 17
INPUT OPTICAL WAVEGUIDE 11

FIG.7

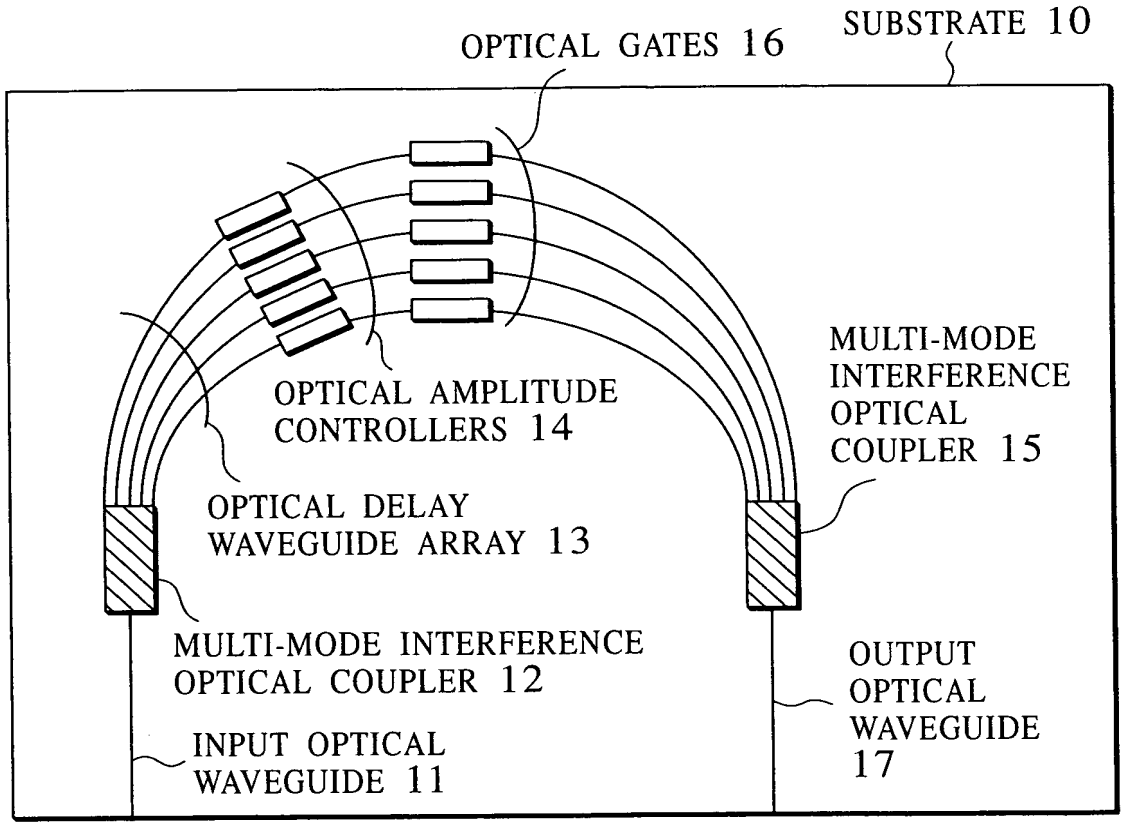
OPTICAL GATES 16
SUBSTRATE 10
MULTI-MODE INTERFERENCE OPTICAL COUPLER 15
OPTICAL AMPLITUDE CONTROLLERS 14
OPTICAL DELAY WAVEGUIDE ARRAY 13
MULTI-MODE INTERFERENCE OPTICAL COUPLER 12
OUTPUT OPTICAL WAVEGUIDE 17
INPUT OPTICAL WAVEGUIDE 11

FIG.8

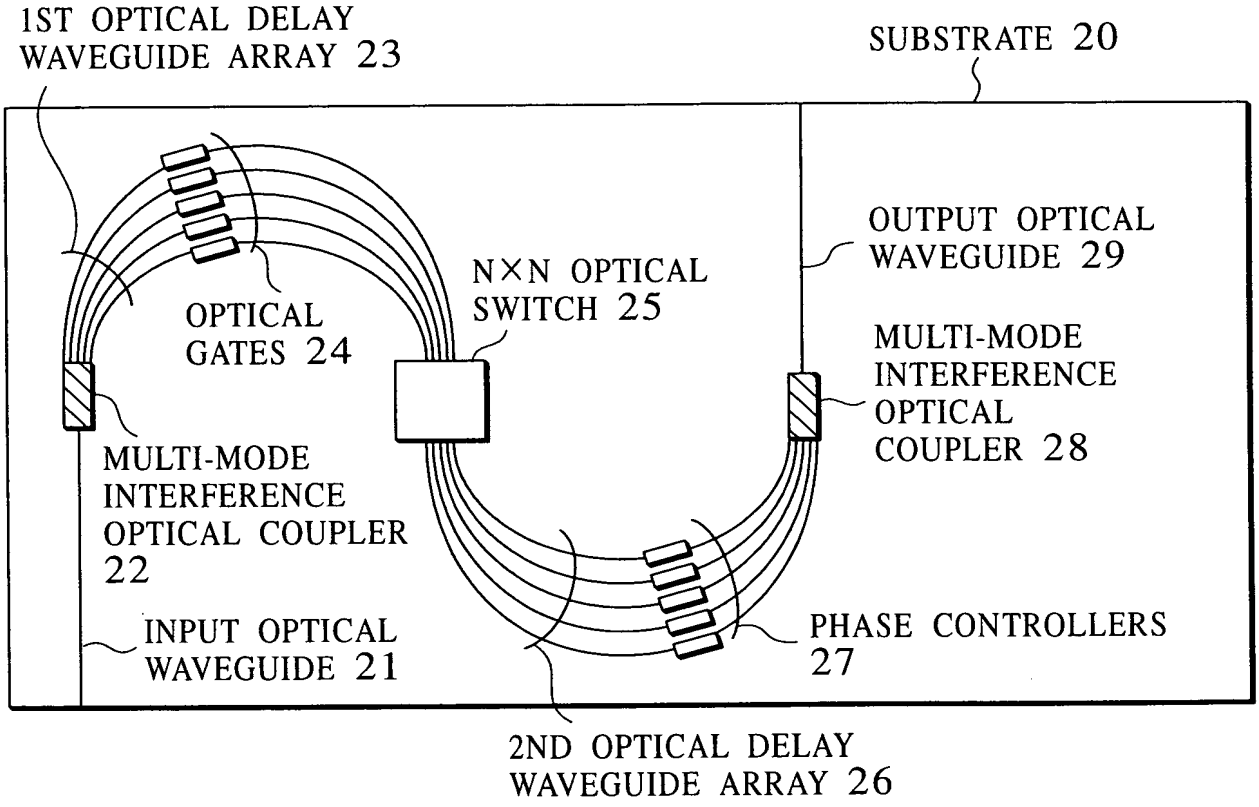
1ST OPTICAL DELAY WAVEGUIDE ARRAY 23
SUBSTRATE 20
OUTPUT OPTICAL WAVEGUIDE 29
N×N OPTICAL SWITCH 25
OPTICAL GATES 24
MULTI-MODE INTERFERENCE OPTICAL COUPLER 28
MULTI-MODE INTERFERENCE OPTICAL COUPLER 22
INPUT OPTICAL WAVEGUIDE 21
PHASE CONTROLLERS 27
2ND OPTICAL DELAY WAVEGUIDE ARRAY 26

FIG.9

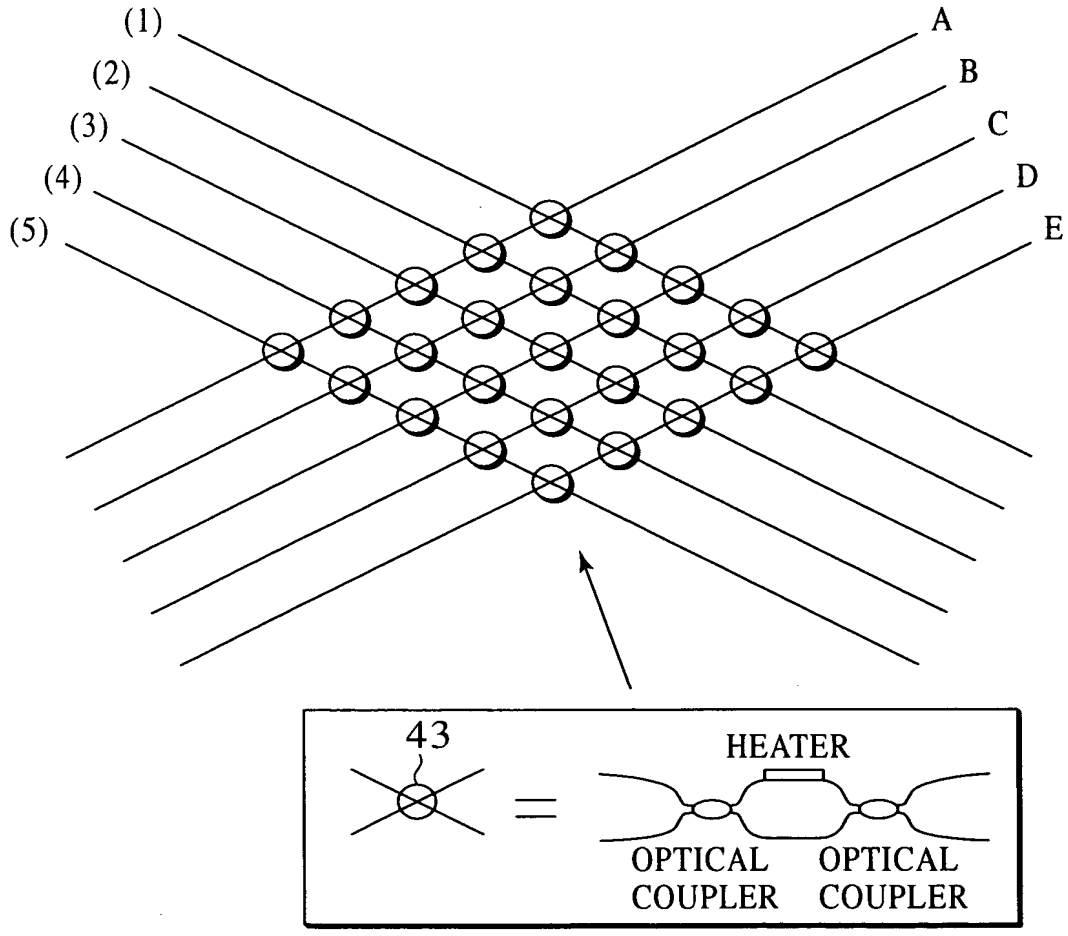

FIG.10

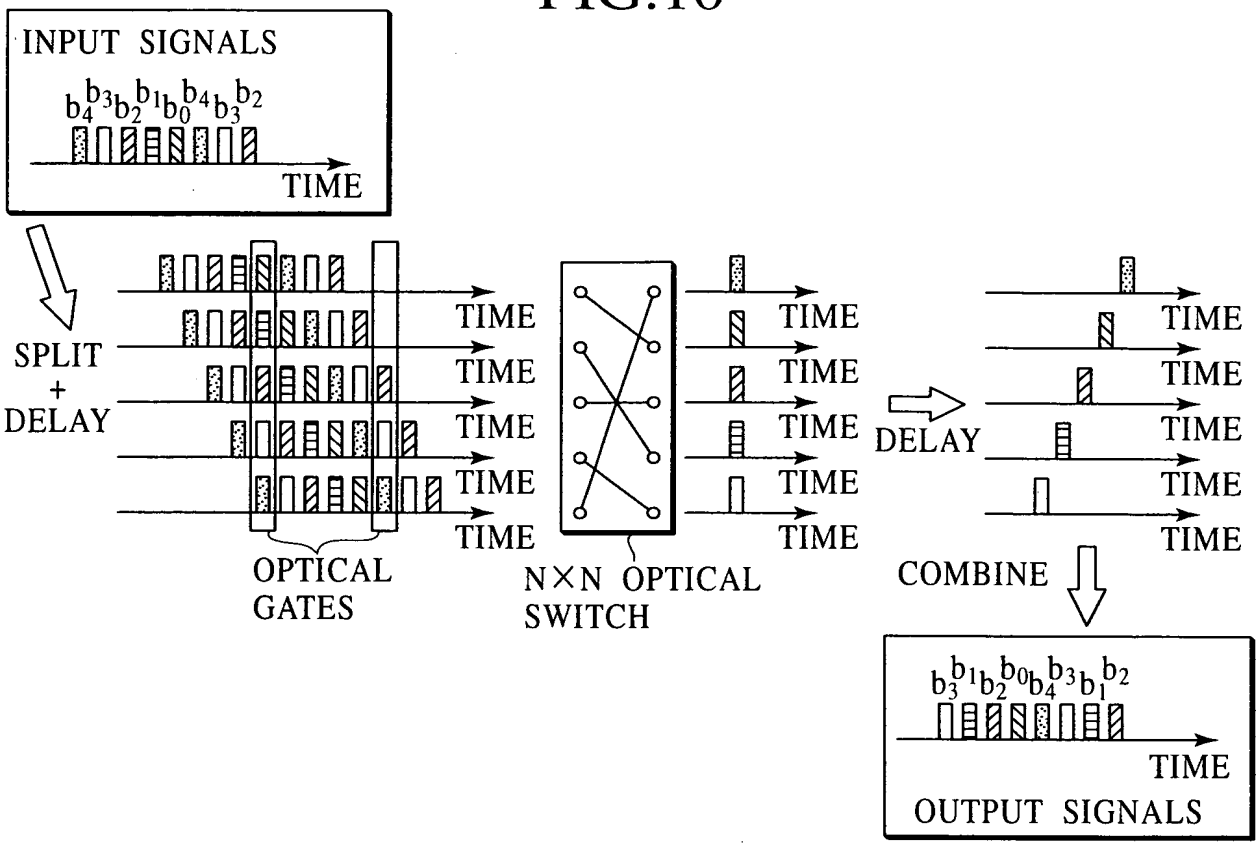
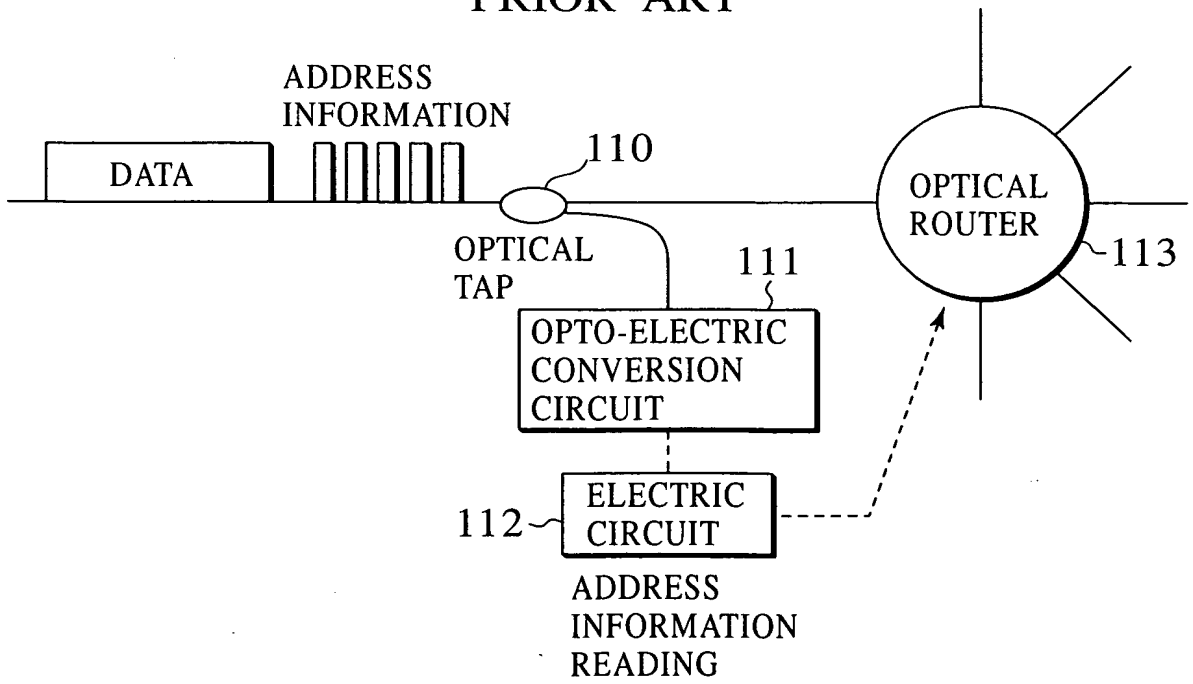
FIG.11
PRIOR ART